



## REKLUSE MOTOR SPORTS

The Rekluse z-Start Pro Auto-Clutch Kit

# INSTALLATION GUIDE

Doc ID: 191-277  
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2000+ Yamaha TT-R 125

## INSTALLATION TIPS

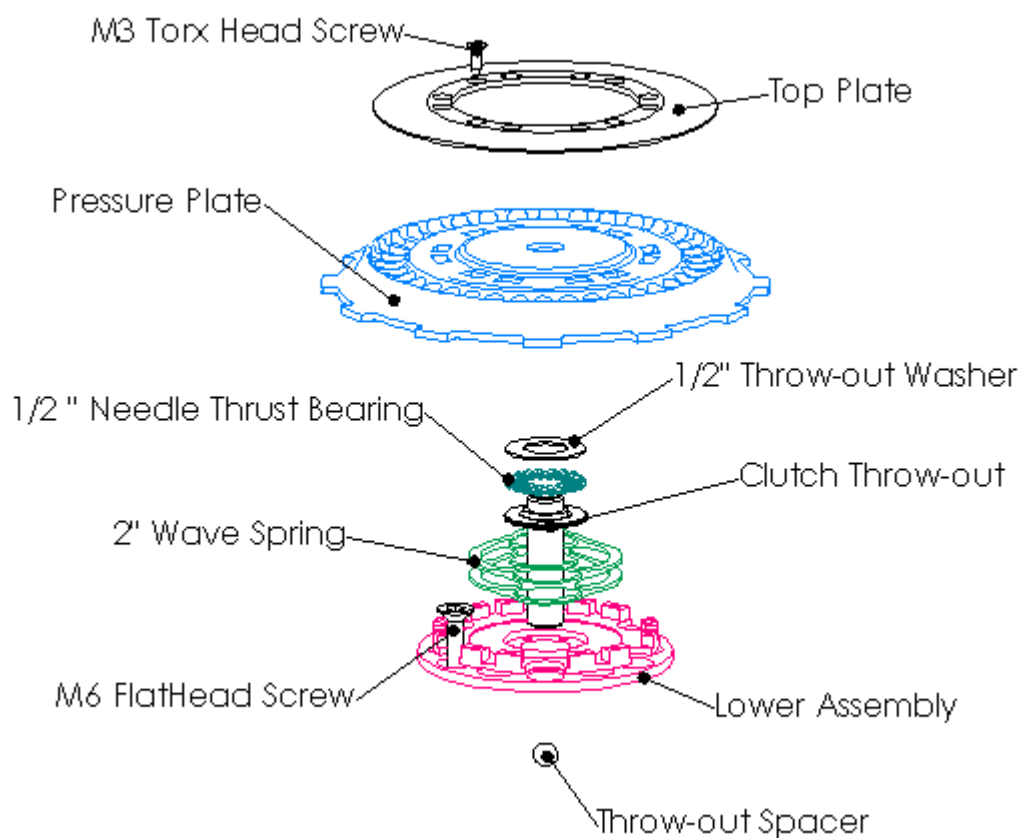
- Watch the complete installation video on our website at [www.rekluse.com/videos](http://www.rekluse.com/videos)
- Be sure to use proper eye protection
- Laying the bike on its left side allows for easy clutch access and eliminates the need to drain oil
- An air or electric impact wrench works well to remove the center clutch nut, or you can place the bike in top gear and hold the rear brake while loosening the center clutch nut with a socket
- Channel-lock style pliers work best to bend the tabs of the washer up over the center clutch nut

## TOOLS NEEDED

- 8mm & 19mm sockets
- 10mm end wrench
- 3mm & 6mm Allen key
- ¼" Driver for included T10 Torx bit
- 2 sets of feeler gages
- Fine-Tooth Metal File
- Torque wrench (in-lb or N-m)

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# CLUTCH OVERVIEW



**Note:** The Lower Assembly is packaged underneath the Pressure Plate and held in place with two screws through the Top Plate.

**Note:** The 1/2" Throw-out Washer and Throw-out Spacer pictured above are not needed for this model.

# INCLUDED PARTS

**Note:** spare screws, balls and shims may be included with your clutch

- Top Plate
- Lower Assembly
- 4x .055" (1.4mm) Drive Plates
- 4x M5 Head Screws
- ½" (12.7mm) Throwout Needle Thrust Bearing
- 1.5" (38mm) Wave Spring (CL150L1)
- 1.5" (38mm) Wave Spring (CL150L2)
- 12x M3 T-10 Torx Screws
- 15x 3/8" (9.53mm) Tungsten Carbide Balls
- 30x 3/8" (9.53mm) Steel Balls
- .045" (1.14mm) Center Clutch Guide
- 20x M5x1.0mm washers (to go back to stock)

## BASIC Z-START CLUTCH OPERATION

The z-Start Auto Clutch functions through centrifugal force. As engine RPM increases, the balls contained in the z-Start Pressure Plate travel up the ball ramps and push against the Top Plate. This action forces the Pressure Plate to engage the clutch pack.

## INSTALLATION TIPS

In order for the z-Start Clutch to perform properly, it must be mounted properly.

- Measuring and maintaining the Installed Gap is **critical**. If the Installed Gap is too big the clutch will slip excessively and cause rapid clutch wear. If the Installed Gap is too small, the clutch will drag and cause engine stall.
- Recognize that the Pressure Plate travels along the tabs of the Lower Assembly as it engages and disengages. Anything preventing this travel will prevent full engagement and cause the clutch to slip excessively.

***Be very careful not to drop any screws, washers or springs into the crankcase opening!*** It is surprisingly easy to drop a little screw or washer down into your crankcase. It is not always so easy to get it out. Make sure all parts going in and coming out are accounted for before you finish the installation. A strong magnetic probe can often be used to retrieve little parts if you happen to drop something in

**Attention TTR 125 Customers:** The following outlines Clutch Basket Dampener Failure. Some Clutch baskets will last a season, and some last only hours. If the dampeners go unchecked clutch damage will result. After reading through the following continue on with the z-Start installation and inspect basket.

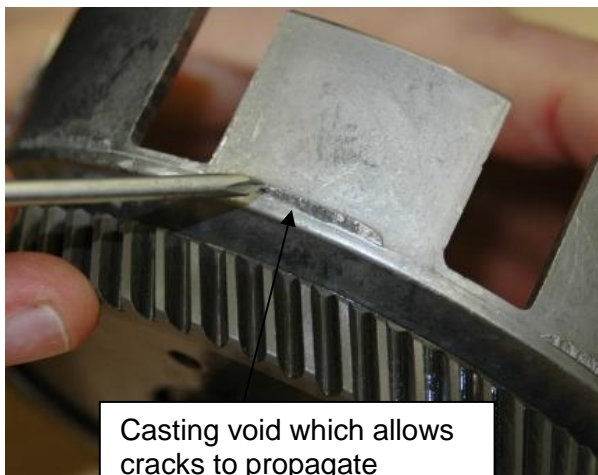
### **Background for Clutch Basket Dampener Failure:**

The OEM Clutch Baskets for the TTR 125 use elastometer dampeners to protect the clutch from shock loading applied to the basket by the drive train and/or engine during normal operating conditions. The dampeners are located inside the clutch basket behind the ring gear. The dampeners take up the slack between the ring gear and clutch basket so that under normal loading they rotate as one. Under extreme loading the dampeners provide a cushion so the ring gear and basket can float independently and keep shock loads from being transferred to the clutch.

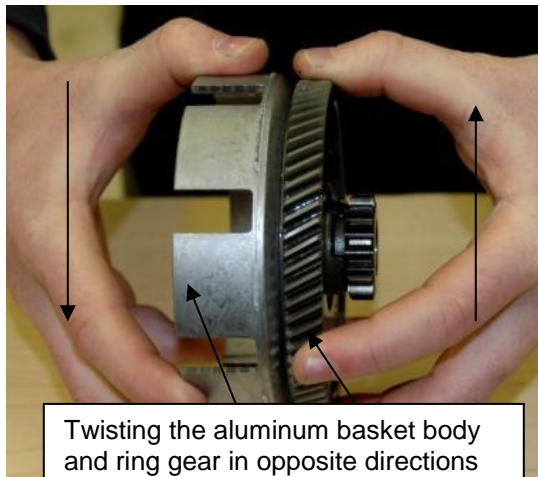
As the dampeners wear and shrink the system gains slack and shock loads start getting transferred to the clutch. This creates hammering between the clutch basket and ring gear. The hammering transfers to the clutch plates and causes the plates to wear away at the clutch basket and center clutch hub. The aluminum core portion of the TTR basket can have casting flaws at the base of each tang (see following picture) and with loose dampeners the hammering can cause the tangs to fracture and break away from the basket causing severe engine damage.

### **Checking Your Clutch Basket for Dampener failure:**

Prior to installing the z-Start, it is recommended that you check the radial fit between the ring gear and basket core. To do this, remove the basket (when you remove the center clutch for standoff modification) and hold the ring gear in one hand and the basket core in the other and try to rotate the two parts independent of each other. Ideally you should feel little to no give between the two parts. If you are able to rotate the two parts easily and the fit feels loose then the basket needs to be replaced. **See the following picture.**



Casting void which allows cracks to propagate leading to tang fracture



Twisting the aluminum basket body and ring gear in opposite directions to check for loose dampeners.

### **Maintaining Clutch Basket Dampeners:**

Unfortunately the OEM clutch basket does not provide a means to maintain the dampeners. After the dampeners wear out, the clutch basket must be replaced. The choice is either an OEM clutch basket, or an after market basket. The advantage of an after market basket is that the basket core is usually billet aluminum which is much less likely to fracture even with loose dampeners.

**Warning:** Installing the z-Start into a worn out clutch basket can greatly reduce clutch performance, and damage the z-Start Pressure Plate.

## BIKE PREPARATION AND DISASSEMBLY

1. Turn the gas petcock to the off position and route the gas cap vent tube into the air. When you lay the bike over on its side, the gas in the bowl will drain out of the overflow tube. Be prepared to catch the gas in a suitable container to prevent a fire hazard.
2. Disconnect the clutch cable from the clutch lever. Carefully lay the bike on its left side so the clutch-cover faces up.
3. Remove the kickstart and rear brake pedal. Remove the right side case cover bolts with an 8mm socket and carefully remove the clutch cover.

**Note:** On electric start equipped models you will need to remove the two 8-mm bolts holding it to the case cover. Simply pull it out and rotate it out of the way of the cover.

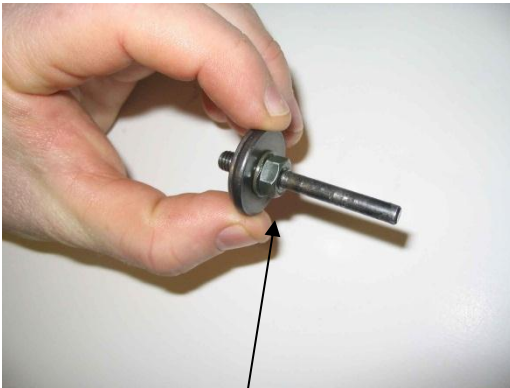
4. Using an 8mm socket, remove the 4 bolts and springs holding the stock pressure plate to the inner clutch hub.
5. Using a 10mm wrench, remove the nut that is securing the Throw-out to the Pressure Plate.



Next, remove the stock Pressure Plate. **See following picture.**

The Pressure plate, 4 bolts, and springs are not reinstalled.

6. Thread the nut that was previously removed from the top of the Throw-out up the backside of the Throw-out. Adjust the position of the Throw-out Thrust Washer by threading the top nut down so there are 4-5 threads showing past the top nut. **See following pictures.**



Top Nut and Washer moved to backside of the Thrust Washer

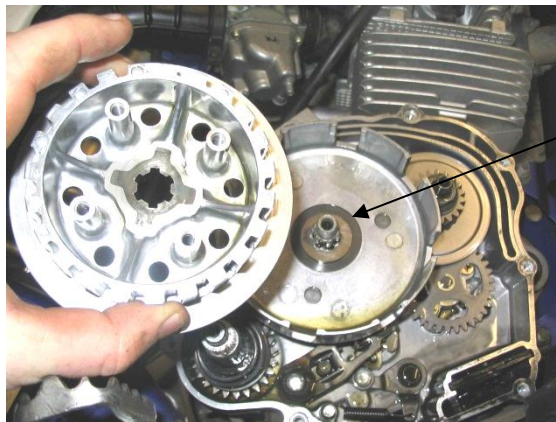


Throw-out Thrust Washer adjusted so 4-5 threads are visible above Top Nut.

7. Remove your clutch pack and set it aside. Keep it in order because it will be re-installed.

## MODIFYING THE STOCK CENTER CLUTCH

8. Remove the center clutch by folding back the Tab Lock Washer and using a 19mm socket. Take the center clutch to a place where no filings can be dropped into the engine case opening. Ensure the Thrust Washer behind the center clutch remains on top of the clutch basket. **See following picture.**



Thrust Washer sitting on top of clutch basket.

**Note:** 20 x M5 x 1.0-mm washers are provided so the clutch can be re-assembled to the stock configuration.



9. Place the included *0.045" Center Clutch Guide* over the studs on the center clutch and use a fine tooth file to file the studs down smooth with the Center Clutch Guide. Remove the guide and use some emery cloth to smooth the studs' edges. **See following pictures.**

**File studs down so they are flush with the included Center clutch guide.**



**Note:** Per the Basket notice on page 4, check the basket for excessive basket dampener play.

10. Clean the Center Clutch of filings and reinstall the Center Clutch. Make use of the stock Tab Lock Washer and use a 19mm socket to torque the nut 50 foot pounds. **Ensure that the thrust washer is in place between the clutch basket and center clutch.**

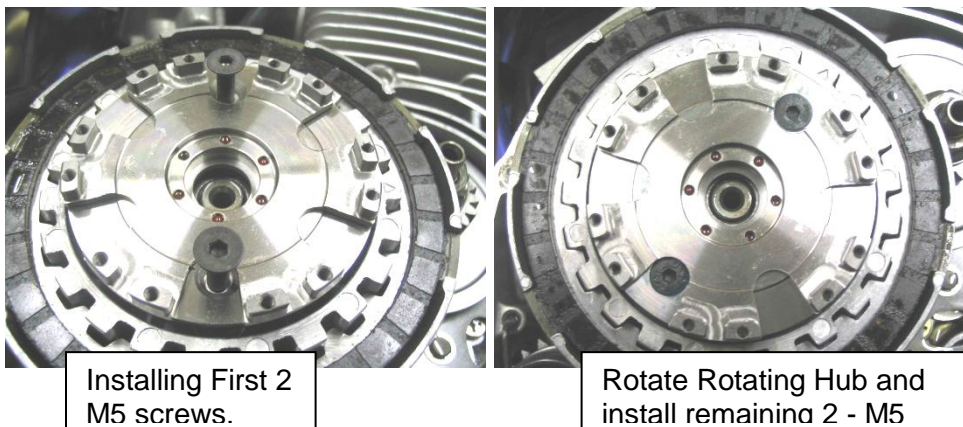
**Note:** 20 5-mm x 1-mm thick washers are included to return the 4 stand-offs to stock height. If returning the clutch to stock, place 5 washers on top of each standoff.

11. Re-install the clutch pack, but exchange one stock .047" drive plates with a *Rekluse .055"* drive plate. The additional *Rekluse .055"* drive plates are used to compensate for clutch pack wear.

**Note:** At this point you will have 1 stock drive plate removed from you clutch pack.

## INSTALLING THE LOWER ASSEMBLY

12. Place the z-Start *Lower Assembly* over the 4 center clutch stand-offs. Line up the countersunk holes of the Lower Assembly with the holes in the center clutch standoffs. Only 2 countersunk holes are visible at one time—you will have install 2 M5 flat head screws then rotate the Rotating Hub to install the remaining 2 screws. Apply blue Loctite 243 to all 4 screws and torque the M5 screws to 96 *inch* pounds. After the 4 screws are torqued-down, the *Rotating Hub* should spin freely. **See following pictures.**

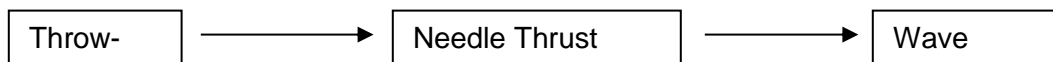


## ASSEMBLING THE THROWOUT, PRESSURE PLATE, AND TOP PLATE

13. Guide the reconfigured stock Throw-out into the hole in the transmission input shaft.

Place the  $\frac{1}{2}$ " *Needle Thrust Bearing* on top of the Stock Throw-out.

Place the 1.5" *C150L2 Wave Spring* on top of the Lower Assembly. The *C150L2 Wave Spring* is the taller of the two wave springs provided with the kit. This is our recommended setting for engagement RPM—refer to the chart on the last page of these instructions for other adjustment settings.



**Warning:** Perform the next step away from the bike to keep the balls from falling into the transmission.

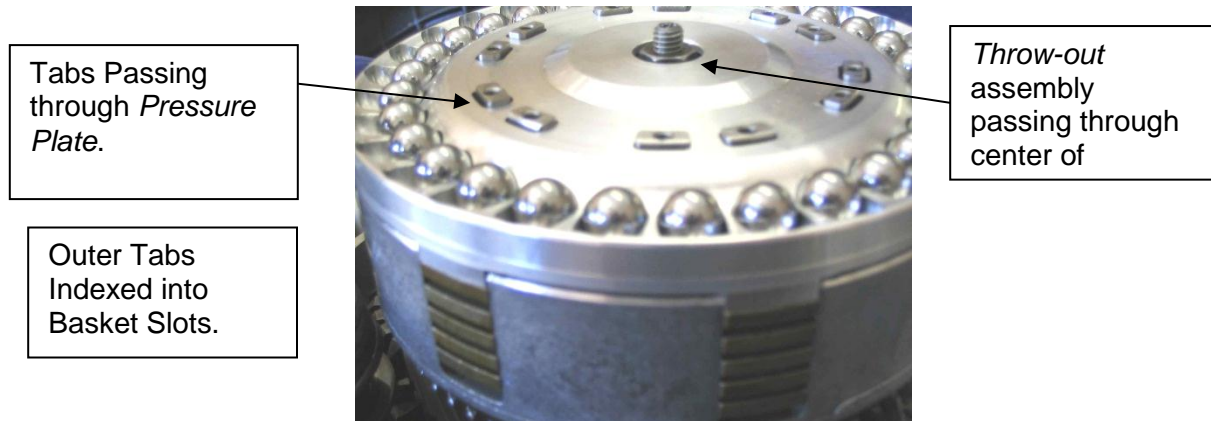
14. Place a small amount of oil in each of the *Pressure Plates* ball grooves. You will use the 15 *Tungsten Carbide balls* and 15 of the steel balls. Install 1 *Tungsten Carbide ball* followed by 1 steel ball into the ball grooves. Work your way around the pressure plate in this alternating pattern so that the clutch will be balanced. The tungsten balls are heavier so if you get them mixed up you can tell them apart.

**Note:** You will have 15 steel balls left over.

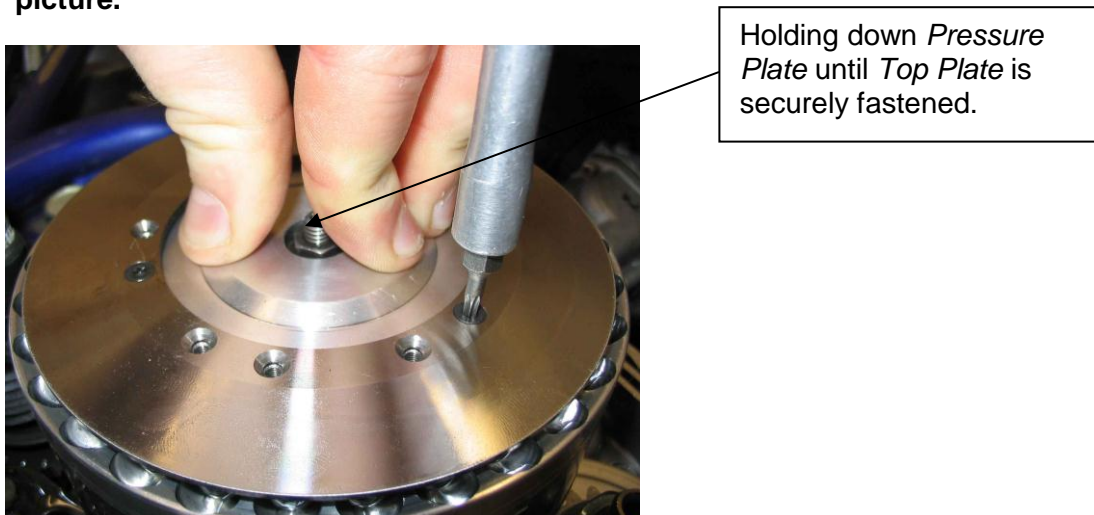


15. Place the *z-Start Pressure Plate* over the *z-Start Lower Assembly*. Index the outer tabs of the *Pressure Plate* into the “half-moon windows” of the clutch basket. **The outer tabs of the Pressure Plate index into the same clutch basket windows the outer tabs of the friction disks do.**

Also ensure that the tabs of the *Lower Assembly* pass through the associated cut-outs in the *Pressure Plate*. Make sure the top of the *Rekluse Throw-out* assembly passes through the hole in the center of the *z-Start Pressure Plate*. **See following picture.**



16. While holding the *Pressure Plate* down place the *Top Plate* over the *Pressure Plate* and fasten it to the tabs of the Lower Assembly with three of the M3 screws in a triangular pattern. Lightly tighten each screw using a 1/4" driver and the included Torx T10 driver tip. **See following picture.**



**Note:** You will have to overcome the *z-Start Wave Spring* and hold the *Pressure Plate* down until the 3 screws are securely fastened in order to tighten the *Top Plate* down properly.

## DETERMINE THE INSTALLED GAP OF THE Z-START

17. Measure the installed gap of the z-Start. Two sets of feeler gauges are required to measure the Installed Gap. The feeler gauges must be placed between the top most **friction disk** and the top-most **steel drive plate** in the clutch pack 180° apart. **See following pictures.**

**Note:** Insert the 2 sets of feeler gauges directly across from one another (180° apart) to avoid the clutch pack from rocking resulting in an inaccurate measurement. Find the thickest feeler gauge that still slides back and forth with slight resistance.

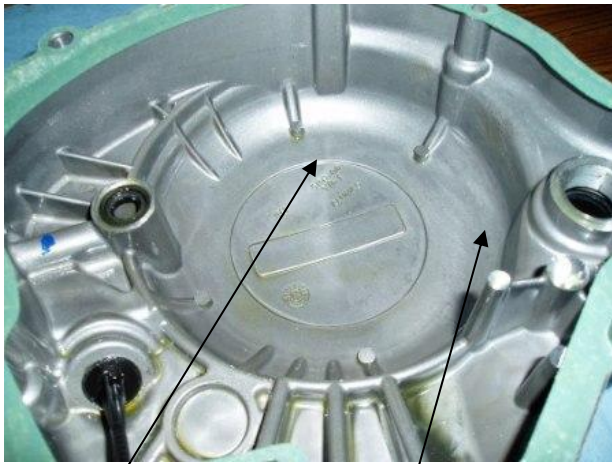


Your installed gap measurement above needs to be between .040" (1mm) to .050" (1.15mm). .045" is ideal.

If the gap is greater than .045", you need to exchange out one stock .047" (1.2mm) steel drive plate in the clutch stack and replace it with a *Rekluse .055" (1.4mm) steel drive plate*. Exchange stock .047" (1.2mm) drive plates with *Rekluse .055" (1.4mm) drive plates* or vice versa as needed to get the correct measurement. Repeat steps 16 and 17 until measurement is within range.

## FINAL INSTALLATION STEPS

18. Using a small amount of Blue Loctite 243, install the rest of the M3 torx head screws and torque to 10 **inch**/pounds. 10 inch-pounds requires a good crank with the included Torx T10 driver tip, but be careful not to bend the head of the T10 driver tip. Remove the three marked M3 screws, add Loctite, and tighten. **Note: Use Loctite 243** (Blue, oil resistant) to secure all M3 Torx screws
19. **'00-'03 Models Only:** Go to step 21.  
**'04+ Models Only:** To eliminate interference with the z-Start Auto Clutch in '04-'08 TTR models, you must grind off **one** of the ribs located on the inside of the clutch cover. You must grind it off almost flush with the inner side of the cover to prevent interference. A Dremel tool works well for this. **See following pictures.**



Rib that is

Kick Start Shaft



Rib after it is ground

20. The above pictures show the rib that needs to be removed and how far it needs to be ground down. When grinding down the rib, be careful to keep aluminum shavings out of the various oil passages inside the cover—rags and tape work well. When done be sure to clean shavings out of the cover to keep them out of the motor.
21. Re-install your clutch cover and torque the clutch cover bolts to 6 to 8 foot/pounds. Re-install the kick-start and brake pedal. Re-install starter if applicable.
22. Re-attach the clutch cable to the clutch lever. It is necessary to adjust the slack in the clutch cable so that there is 5-10 mm of play at the end of the clutch lever when the engine is revved to at least 4500 RPM. **Start the engine and ensure the transmission is in neutral, rev the engine to 4500 RPM's, and adjust the clutch cable so that when the engine is revved there is 5-10 mm of play at the end of the clutch lever.**

**Warning:** The z-Start allows the bike to idle in gear just like if it were in neutral. Quickly revving the engine with the transmission in gear will cause the bike to lunge forward unexpectedly—always ensure the transmission is in neutral before adjusting the clutch cable slack.

**Warning:** Improper clutch-cable slack adjustment can cause excessive clutch slip and ultimately clutch failure.

**WARNING:** After a 20 minute break-in period, the clutch plates will seat in and you must re-measure the Installed Gap to guarantee the Installed Gap is within the prescribed range—make drive plate adjustments if necessary. See step 17.

Clutch break-in re-measurement of the Installed Gap is necessary whenever new clutch plates are installed.

**WARNING:** Refer to the “Safety Warnings” and “Break-in Tuning and Maintenance Guide” before operating the z-Start clutch.

See next page for adjustment options.

## ADJUSTING THE Z-START ENGAGEMENT RPM

The engine speed at which the z-Start begins to engage the clutch, also called the stall speed, can be adjusted. Included with the z-Start are two 1.5" *Wave Springs*. The *Wave Springs* are located inside the z-Start between the *Pressure Plate* and *Lower Assembly*. To adjust the stall speed, it is necessary to remove the engine side cover and the M3 screws holding the z-Start *Top Plate* to access the *Wave Spring*. Refer to the z-Start Parts View and the installation instructions for detailed information on how to change the *Wave Spring* configuration.

**Use the following** as a guideline for setting the stall speed. Remember many factors can affect the stall speed from bike to bike so the following chart is only a guideline. You can also make fine tuning adjustments by adjusting your idle speed.

CS150L1 Wave Spring  
C150L2 Wave Spring

Low Stall Speed (typically just above idle)  
Medium Stall Speed – Recommended setting

